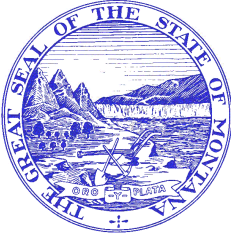


# DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

## Trust Land Management Division



BRIAN SCHWEITZER, GOVERNOR

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PO BOX 201601  
HELENA, MONTANA 59620-1601

October 3, 2008

Dear Reader:

The Montana Department of Natural Resources, Trust Land Management Division, has prepared an Environmental Assessment for state trust lands and water resources division lands in the Corral Creek Plan of Development in Sections 25 and 36, Township 8 South, Range 40 East, and Sections 1 and 2, Township 9 South, Range 40 East in Bighorn County, Montana.

Please provide written comments on this Environmental Assessment by November 3, 2008. The project proposal will be presented to the State Board of Land Commissioners at their November 17, 2008 meeting. Comments can be submitted either electronically or by mail to the following:

Monte Mason  
Department of Natural Resources and Conservation  
Trust Land Management Division  
P.O. Box 201601  
Helena, MT 59620-1601  
mmason@mt.gov

If you have any questions regarding this Environmental Assessment, please call (406) 444-9518. We appreciate your interest in the management of state trust lands.

Sincerely,

Bobbi Jo Coughlin  
Petroleum Engineer  
Minerals Management Bureau

**STATE OF MONTANA**  
**DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION**  
**TRUST LAND MANAGEMENT DIVISION**



**ENVIRONMENTAL ASSESSMENT**  
**FIDELITY EXPLORATION AND PRODUCTION COMPANY**  
**CORRAL CREEK PLAN OF DEVELOPMENT**

**Township 8 South, Range 40 East, Section 25: S ½ and Section 36: All**  
**Township 9 South, Range 40 East, Section 1: All and Section 2: All**  
**Big Horn County, Montana**

**DRAFT**

**October 3, 2008**

## CHAPTER 1 PURPOSE AND NEED FOR ACTION

### 1.1 Proposed Action

Fidelity Exploration and Production Company (Fidelity) has proposed a plan of development (POD) known as the Corral Creek POD. This POD includes the drilling of 23 coal bed natural gas (CBNG) wells [6 federal (three of which are state surface), 8 state (one of which belongs to the Water Resource Division), and 9 fee] to several different coal seam targets within the Fort Union Formation through “mono-bore” drilling techniques. This entails drilling one well at each location, completing the wells in one or more of the coal seams rather than drilling multiple wells per pad site. This area is located on the east side of the Tongue River Reservoir. Project construction is proposed to commence immediately upon issuance of required permits and approval. Montana Board of Oil and Gas Conservation (MBOGC) accepted this POD for review on March 27, 2008. The MBOGC completed an environmental assessment and signed the Finding of No Significant Impact and Notice of Decision on July 14, 2008 and will issue regulatory permits on 17 wells covering activities on both fee and state lands. The project area lies within the existing CX Field boundary, where 702 wells are currently producing and 163 wells have been approved and are awaiting drilling and/or completion.

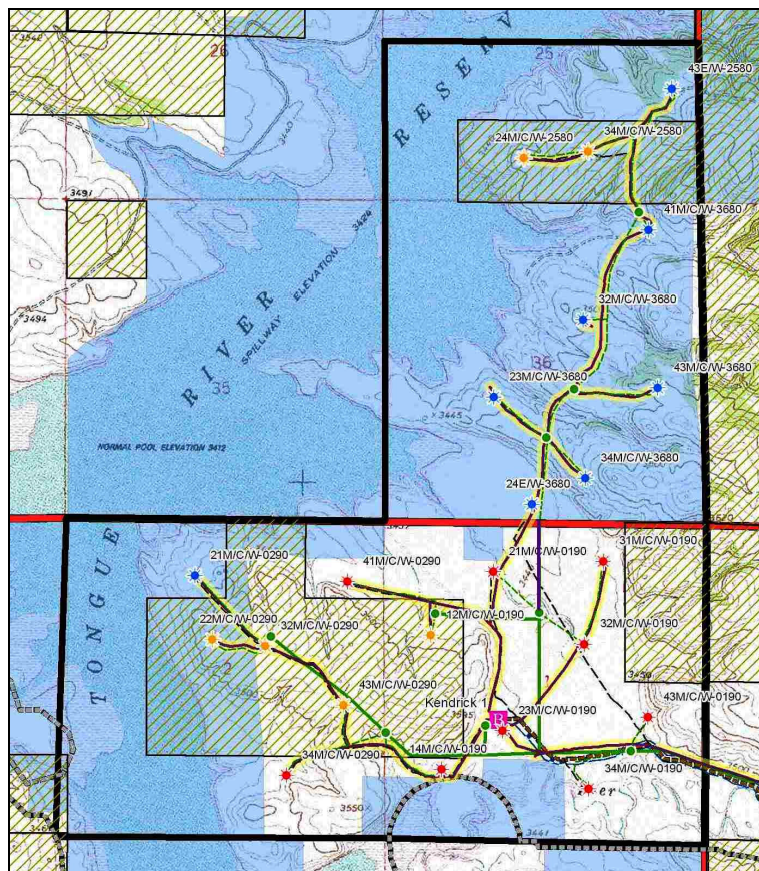


Figure 1: Outline of Corral Creek Project Area

The Montana Board of Oil and Gas Conservation (MBOGC) completed an environmental assessment that analyzed the direct and cumulative impacts from the entire project area on all

fee and state lands within the Corral Creek POD. The cumulative impacts of 17 new CBNG wells within the POD were analyzed, including the eight state wells.

This environmental assessment focuses on the 8 proposed wells on state-owned land. It incorporates by reference and tiers off of the EA completed by MBOGC for the entire project POD. A Finding of No Significant Impact (FONSI) was issued by MBOGC on July 14, 2008. The pertinent documents that are incorporated by reference and utilized in this analysis are as follows:

- The Corral Creek Plan of Development, accepted by MBOGC on March 27, 2008.
- The Corral Creek Plan of Development Environmental Assessment, FONSI issued by Montana Board of Oil and Gas Conservation on July 14, 2008.
- Montana Statewide Final Oil and Gas EIS and Amendment of the Powder River and Billings RMP (MT FEIS) approved April 30, 2003.

## **1.2 Need for the Action**

Fidelity holds valid state, federal, and private oil and gas leases within the Corral Creek Project Area. Fidelity submitted a request to drill coal bed natural gas wells on state land to the Montana Department of Natural Resources and Conservation, Trust Land Management Division (TLMD) and the Water Resources Division (WRD) in February 2008. Oil and gas leases issued by the State of Montana require the lessee to submit proposed activities on the state lease to the department for review. The Montana Environmental Policy Act (MEPA) requires that an environmental review be completed if the action has a potential for impacting the human environment.

The Montana Department of Natural Resources and Conservation, Trust Land Management Division manages state owned trust lands under the direction of the State Board of Land Commissioners (Land Board). Both the Land Board and the Department have the fiduciary duty to manage and utilize these lands to generate revenue for the trust beneficiaries, which are the schools throughout the state of Montana. It is TLMD's responsibility to consider environmental impacts and to protect the future income generating capacity of the lands. Water Resources Division lands within the POD area are managed by TLMD, but decision making authority is reserved by their administrator.

Coal Bed Natural Gas Operations began in Montana in 2003. There are currently two operators that are active in Montana, Fidelity and Pinnacle Gas Resources. Since the first wells were drilled on state lands and began producing in 2003, total revenue has reached over \$4.5 million for the school trust fund with current revenue exceeding \$95,000 per month.

## **1.3 Relevant Plans, EISs, EAs, Regulations, and Other Documents**

**1.3.1** Montana Final Oil and Gas EIS and Amendment of the Powder River and Billings Resource Management Plans (MT FEIS) approved April 30, 2003.

**1.3.2** The Fidelity Exploration and Production Company Corral Creek Plan of Development EA and FONSI, accepted by the Montana Board of Oil and Gas Conservation March 27, 2008 and approved July 14, 2008.

**1.3.3**

## **1.4 Objectives of the Action**

**1.4.1 Objective #1:** Develop a coal bed natural gas project in southeastern Montana encompassing fee and state mineral development.

**1.4.2 Objective #2:** Operate state and fee wells collectively, sharing facilities constructed and operating on the leases.

**1.4.3 Objective #3:** Increase the revenue generated for the State of Montana school trust fund.

### **1.5 Decision(s) That Must Be Made**

The Minerals Management Bureau Chief of the Trust Land Management Division of the Montana Department of Natural Resources and Conservation must decide whether to allow the development of coal bed natural gas (as briefly described in Section 1.1 and in detail in Section 2.2). He must also determine if the selected alternative (plan) would or would not be a major State action, significantly affecting the quality of the human environment. If the Bureau Chief determines that it would not significantly affect the quality of the human environment, then he could prepare and sign a Record of Decision (ROD) and the project could proceed, subject to approval by the Land Board. Otherwise, an EIS and a ROD must be prepared and signed before the Corral Creek Project could proceed.

Water Resources Division must also review the project proposal and decide whether or not to allow the well on water resources land to be drilled. There is currently a no surface occupancy stipulation on the lease that can only be removed by the Administrator.

### **1.6 Scope of this Environmental Analysis**

#### **1.6.1 Issues Studied in Detail**

##### **1.6.1.1 Air Quality (Issue #1)**

Increased activity in the project area could result in increased air emissions from drilling equipment and increased travel to and from the well locations for the duration of the project.

##### **1.6.1.1 Cultural Resources (Issue #2)**

Land disturbance caused by constructing the well pads and the related infrastructure that is necessary for completion of this project could have an impact on the cultural resources in the area.

##### **1.6.1.2 Hydrology (Issue #3)**

Coal bed natural gas production carries water from the coal seams during the initial production phases. Management of produced water would consist of direct discharge of untreated water under an existing MPDES permit, treated water discharge under an existing MPDES permit, transfer to stock water reservoirs and tanks for livestock and wildlife, and provide water to Fidelity personnel and its contractors for industrial use, including drilling, construction, and dust control.

##### **1.6.1.3 Lands and Realty (Issue #4)**

There is currently a State of Montana Grazing lease that covers multiple state tracts within and adjacent to the project area. Increased coal bed natural gas development could decrease the AUMs that are currently set for this lease and could interrupt grazing patterns during the drilling and construction phases.

##### **1.6.1.4 Soils (Issue #5)**

Construction of the well pads and infrastructure and the increased travel on the two track trails into state lands could result in soil impacts and effect soil productivity depending on area and degree of physical effects. Erosion could also be a problem throughout the duration of this project.

##### **1.6.1.5 Vegetation (Issue #6)**

Construction of the well pads and infrastructure and the increased travel on the two track trails into state lands could result in the temporary removal of

vegetation. Increased activity in the area could increase the potential for noxious weed introduction.

1.6.1.6 Wildlife (Issue #7)

Coal bed natural gas development could alter the habitat or create disturbance that could be detrimental to wildlife species.

1.6.1.7 Social and Economic (Issue #8)

Coal bed natural gas development would positively impact the revenue generated for the school trust fund.

1.6.1.8 Noise (Issue #9)

Coal bed natural gas development would increase the noise level in the project area during the initial drilling phase.

1.6.1.9 Aesthetics (Issue #10)

Drilling and completing the eight wells on state lands could impact the aesthetics of the region.

1.6.2.3 Recreation (Issue #11)

Wildlife uses the state land during transition from more favorable habitat. As a result, there is some recreation potential for fall hunting of big game. In addition, the Tongue River Reservoir, which is adjacent to this project, is a highly recreated area.

## **1.7 Applicable Permits, Licenses, and Other Consultation Requirements**

1.7.1 Air Quality Permits from MDEQ for drilling rig operations

1.7.2 Approved Untreated Water Discharge Permit (MT0030457)

1.7.3 Approved Treated Water Discharge Permit (MT0030724)

1.7.4 Approval from Water Resources Division of Montana Department of Natural Resources and Conservation for the State 21M/C/W-0290 well

## CHAPTER 2

### ALTERNATIVES INCLUDING THE PROPOSED ACTION

#### 2.1 Introduction

The purpose of this chapter is to describe and compare the alternatives by summarizing the environmental consequences. There are two alternatives outlined in this chapter: the No Action Alternative (Alternative A) and the Proposed Action (Alternative B). Based on the descriptions of the relevant resources in Chapter 3: Affected Environment and the predicted effects of both alternatives in Chapter 4: Environmental Consequences, this chapter presents the predicted attainment of project objectives and the predicted effects of all alternatives on the quality of the human environment in comparative form, providing a basis for choice among the options for the decision makers and the public.

#### 2.2 Description of Alternatives

##### 2.2.1 Alternative A: No Coal Bed Natural Gas Development (No Action)

###### 2.2.1.1 Principal Actions of Alternative A

Coal bed natural gas on state land would not be developed. However, ongoing DNRC permitted and approved activities would continue in the project area:

- Livestock grazing: an existing surface lease that covers common schools land in section 25 with 36 AUMs (animal unit months) and section 36 with 81 AUMs would continue on the project area.
- Offset Development: Selection of Alternative A does not prevent offset lands from being developed for coal bed natural gas production.

###### 2.2.1.2 Past Relevant Actions

The plan of development area lies within the existing CX Field boundaries. There are currently 702 productive coal bed natural gas wells in that field and another 163 that have been approved and are awaiting drilling and/or completion. All are operated by Fidelity Exploration and Production Company.

###### 2.2.1.3 Present Relevant Actions Not Part of the Proposed Action

The Montana Board of Oil and Gas Conservation issued a FONSI for the Corral Creek Plan of Development EA on July 14, 2008. Based on the analysis of cumulative impacts from development of state and private minerals, they determined that there would be no significant direct, indirect, or cumulative impacts as a result of coal bed natural gas development in the POD area. As a result, fee minerals will be developed in the POD area surrounding the state section.

###### 2.2.1.4 Reasonably Foreseeable Relevant Actions Not Part of the Proposed Action

Pinnacle Gas Resources, Inc. has one Plan of Development, the Black Eagle Butte POD that is currently under MEPA Review. The Anderson Creek POD and Otter Creek POD, also Pinnacle Gas Resources, have been submitted and are awaiting review. Coal bed natural gas development would likely continue in and around the CX Field over the next 30 years.

All of these activities would also occur if Alternative B, which is described in Section 2.2.2, were implemented.

## 2.2.2 Alternative B: Coal Bed Natural Gas Development on State Lands (Proposed Action)

### 2.2.2.1 Principal Actions of Alternative B

- A total of 8 coal bed natural gas wells would be drilled on eight separate pad locations on state lands, with one well per pad site. Each well would be drilled to target coal seams within the Fort Union Formation. In this area, Fidelity typically produces the Dietz, Monarch, Carney, and Wall coal beds. For this POD, they also propose to produce the Smith coal bed, where feasible, and possibly other deeper coal beds (e.g. Carlson, King, and Roberts). The natural gas from the seams would be commingled to minimize the number of wells required on each pad site. There would be less than 1 acres of land disturbance total for all eight well pads. (See Table 1 for state well list). Total disturbance after the construction phase would be less than ½ acre.
- Underground power lines would be located in existing corridors. In addition, an easement application has been submitted for an underground powerline running from the south end of section 36 and ending in the NENE of the section. This line would service the wells on the state section 36 and underground lines would be run north to service additional wells.
- Two track trails would be utilized to access the eight well pads on the state tracts. No all weather roads would be constructed on the state tracts.
- Produced water would be managed through discharge of both untreated water under an existing MPDES permit (MT0030457) and treated water discharge under an existing MPDES permit (MT0030724).

Table 1  
Wells Proposed on State Land

Well Number	Township	Range	Section	Spot Call
State 21M/C/W-0290	9S	40E	2	NENW
State 43M/C/W-2580	8S	40E	25	NESE
State 23M/C/W-3680	8S	40E	36	NESW
State 24M/C/W-3680	8S	40E	36	SESW
State 32M/C/W-3680	8S	40E	36	SWNE
State 34M/C/W-3680	8S	40E	36	SWSE
State 41M/C/W-3680	8S	40E	36	NENE
State 43M/C/W-3680	8S	40E	36	NESE
<b>WELLS ON STATE SURFACE WITH FEDERAL MINERALS:</b>				
State Fed 22M/C/W-0290	9S	40E	2	SESW
State Fed 24M/C/W-2580	8S	40E	25	SESW
State Fed 34M/C/W-2580	8S	40E	25	SWSE

### 2.2.2.2 Mitigation and Monitoring

The Montana Department of Natural Resources and Conservation, Trust Land Management Division has developed the Coal Bed Natural Gas Field Operating and Reclamation Requirements to mitigate disturbances and cumulative impacts to the environment. A copy of these requirements is provided in Appendix A of this environmental assessment.

The Montana Department of Environmental Quality has the regulatory authority over the monitoring of water quality and air quality issues. The Montana Board of Oil and Gas Conservation has the regulatory authority over oil field operations, including drilling and reclamation. In conjunction with these regulating agencies, Fidelity has identified the



following mitigation and monitoring measures in addition to the standard requirements enforced by MDEQ and MBOGC:

- The surface discharge points would be monitored and sampled, and reports would be submitted in accordance with its respective MPDES permit requirements.
- Fidelity would conduct upstream monitoring for several parameters and frequencies under the respective MPDES permit requirements.

## 2.3 Summary Comparison of the Activities, the Predicted Achievement of Project Objectives, and the Predicted Environmental Effects of All Alternatives

### 2.3.1 Summary Comparison of Project Activities

<b>Project Activity</b>	<b>Alternative A (No Action)</b>	<b>Alternative B (Proposed Action)</b>
Drill CBNG wells on State Land	0 Wells Drilled on State Minerals. 3 Wells that are on state surface with federal minerals could be drilled.	8 State Wells Drilled
<b>Overhead Power lines Installed</b>	None	No overhead lines on state tracts.
<b>Underground Power lines</b>	None	Six corridors branching off three power drops on state lands and one power drop on federal lands. An easement application has been submitted by PRE Corp for an underground line traveling from south to north of state section 36 to service POD. Separate approval would be necessary.
<b>Two Track Trails/All Weather Roads</b>	One two track trail running through state section 36 would have to be relocated under this alternative. An alternate route to federal wells would be needed.	No improved roads on state tracts. 2.88 miles of two track corridors would be needed on state lands.
<b>Water lines/Gas lines</b>	None	Water line and gas line installed for each well
<b>Storage Ponds</b>	None	No storage ponds would be constructed for this project
<b>Evaporation Pits</b>	None	No evaporation pits would be constructed for this project
<b>Untreated Water - Discharged</b>	None	Untreated water discharge would occur under existing MPDES permit
<b>Water Treated – Discharged</b>	None	Treated water discharge would occur under existing MPDES permit
<b>Water Quality/Air Quality Monitoring</b>	Required under existing MPDES permit and MDEQ regulations	Required under existing MPDES permit and MDEQ regulations.

### 2.3.2 Summary Comparison of Predicted Achievement of Project Objectives

Project Objective	Alternative A (No Action)	Alternative B (Proposed Action)
<b>Develop a coal bed natural gas project in southeastern Montana encompassing fee, federal and state surfaces/minerals</b>	No state minerals would be developed. Fee minerals would continue to be developed. Federal minerals could also be developed.	State and fee minerals would be developed concurrently. Federal minerals could also be developed.
<b>Operate federal/state/fee wells collectively, sharing facilities constructed and operating on the leases</b>	Fee wells would be operated together. State wells would not be drilled. Federal wells could be drilled and operated concurrently with fee wells.	State and fee wells would share new and existing facilities to reduce the amount of new land disturbance. Federal wells could share in existing facilities.
<b>Increase the revenue generated for mineral owners</b>	State would generate income from wells within spacing units. If all proposed federal and fee wells are developed, common schools would receive approximately \$155,000 and Water Resources Division would receive approximately \$1.2 million in royalties from communitized areas.	State trust fund would receive 12.5% of all gas production on state lands for a total of over \$2.77 million for the life of the project. Water resources division would receive 12.5% or 16.67%, depending on the lease terms, for a total of over \$1.5 million for the life of the project.

### 2.3.3 Summary Comparison of Predicted Environmental Effects

Issue	Alternative A (No Action)	Alternative B (Proposed Action)
Air Quality	No impact to air quality from state activity. Pollutant emissions would occur from fee mineral development. Emissions would be regulated by MDEQ.	Pollutant emissions would occur in the short term but would remain below the limits. Emissions would be regulated by MDEQ.
Cultural Resources	No impact to cultural resources from state activity.	All identified sites within the project boundary would be avoided.
Hydrology	No impact to hydrology from state activity. No discharge from state lands. No evaporation pits or storage ponds would be located on state land. Discharge would be utilized for fee wells and could be used for federal wells.	Water would be discharged to the Tongue River under two existing MPDES permits, one for treated water and one for untreated water. Water would also be transferred to Spring Creek Mine and Decker Mine for industrial use and also used internally by Fidelity for well drilling and completion, facility construction, dust suppression, and related activities.
Lands and Realty	No impact to lands and realty from state activity. Existing grazing lease and oil and gas lease would remain in effect for state lands. The state would still receive its share of royalties for gas production due to communitization agreements with federal and fee mineral owners based on MBOGC established 160 acre spacing for CX field.	8 CBNG wells would be drilled on state lands and related infrastructure put in place. The existing grazing and oil and gas leases would remain in effect.
Soils	No impact to soils from state activity. Grazing of the state section would continue, which may have minor impacts on the soil, such as compaction and erosion.	Increased chance for soil compaction due to vehicle travel and increased chance for erosion due to topsoil and vegetation removal. Degradation in soil quality could also occur.
Vegetation	No impact to vegetation from state activity. Grazing on state lands would continue to harvest vegetation.	Some vegetation would be removed for well pad construction and related infrastructure. Vehicle travel could decrease vegetation quality and quantity. It could increase potential for introduction of noxious weeds.
Wildlife	No impact to wildlife from state activity. Offset fee and federal mineral development	Two Red tailed hawk nests, one burrowing owl, and one great horned owl nest are

	could impact wildlife in the area.	within the project boundary. NSO and setback stipulations would be enforced to ensure no disturbance.
Social and Economic	No impact to social and economic factors from state activity. State and local income tax would be increased due to fee mineral development. Royalty revenue generated for the state trust fund would be \$155,000 and Water Resources Division would be \$1.18 million through communitization agreements with fee and federal minerals.	State and local income tax increase from fee and state development. State trust fund would receive 12.5% of royalties generated on state section for approximately \$2.77 million over the life of the project. Water Resources Division would receive 12.5% or 16.67% for approximately \$1.5 million over the life of the project.
Noise	No increase in noise levels as a result of state activities. Offset fee and federal mineral development could impact noise levels in the area.	Noise levels could increase during the drilling phase of the project.
Aesthetics	No impact to aesthetics as a result of state activity. Offset fee and federal mineral development could impact the aesthetics in the area.	Short term impacts to aesthetics could occur. However, well locations would be located to minimize impacts and stipulations would be enforced to reduce visual impacts.
Recreation	No impact to recreation as a result of state activities. Offset fee and federal mineral development could impact recreation in the area.	There could be some disruption to recreational activities during the drilling phase of this project.

## 2.4 Identification of the Preferred Alternative

Alternative B: Coal Bed Natural Gas Development is the preferred alternative.

## CHAPTER 3 AFFECTED ENVIRONMENT

### 3.1 Introduction

This chapter details the existing condition of the environmental resources and factors of the Corral Creek Plan of Development that would affect or that would be affected by implementing either Alternative A, the no action alternative, or Alternative B, the proposed alternative. Chapter 3 focuses on the site specific issues described in Section 1.6.1.

This description of the existing environment in Chapter 3, the description of the activities of Alternative A: No Action in Chapter 2, and the predicted effects of Alternative A in Chapter 4 combine to establish the baseline conditions against which the decision maker and the public can compare the potential effects of Alternative B: Coal Bed Natural Gas Development on State Lands.

### 3.2 Description of Relevant Affected Resources

#### 3.2.1 Air Quality (Issue #1)

Air pollution is controlled through the ambient air quality and emission standards established by the Clean Air Act and under Montana laws implemented by the Montana Department of Environmental Quality (MDEQ). The Clean Air Act Amendments of 1977 created a system for the Prevention of Significant Deterioration (PSD) of “attainment” and “unclassified” areas. This program is designed to limit the increase of pollutants in areas above a legally defined baseline level. The Montana Ambient Air Quality Standards (MAAQS) establishes upper limits, depending on the classification of the area. PSD Class I areas have more stringent limits than PSD Class II areas. The allowable incremental impacts for NO<sub>2</sub>, SO<sub>2</sub>, and PM<sub>10</sub> within PSD Class I areas are very restricted (MT FEIS). The closest PSD Class I defined area is the Northern Cheyenne Indian Reservation, which lies approximately 18.5 miles north-northeast of the project area.

Pollutants throughout the project area are very limited due to the small number of industrial facilities and residential sources. Activities potentially affecting air quality issues are regulated by the MDEQ.

#### 3.2.2 Cultural Resources (Issue #2)

Cultural Resources are tangible remains of past human activity within the landscape. Cultural Resources are identified and defined as geographic units or “sites” where past human activity occurred and evidence of past use can be documented. Generally, any site of human activity older than 50 years can be considered a cultural resource.

Fidelity Exploration and Production Company contracted Ethnoscience, Inc. to conduct a class III cultural resource inventory of the lands within the Corral Creek Plan of Development area. The surveys were conducted between April 28, 2007 and May 10, 2007.

The Corral Creek project inventory was conducted using pedestrian transects spaced at no more than 30 meter intervals. A total of 23 sites were identified in the inventory area. The sites include 21 prehistoric and 2 historic sites. Three of the sites had been previously documented. The prehistoric sites include 10 stone feature sites and 11 lithic

scatters. Additional work is necessary before eligibility recommendations could be provided.

A Cultural Resource Annotated Bibliography System search was conducted that includes all the sections that would be crossed by this project. In addition, the State Historic Preservation Office's (SHPO) list of properties determined eligible to the National Register of Historic Places was consulted. The following is a description of previous investigations identified in the proposed project area. Several other investigations were conducted on lands adjacent to the POD boundary.

- University of North Dakota 1972 conducted surveys in portions of Big Horn, Rosebud, and Powder River counties that were scheduled for strip mining. Forty sites were identified.
- Murray conducted a literature search in 1973. No sites recorded; however, potential zones were defined.
- Fredlund conducted surveys in 1975 and 1976 of the East Decker Mine and North Extension for the Decker Coal Company. A total of 27 sites were identified. One site, 24BH1520 was identified within the Corral Creek POD.
- Robson and MacDonald conducted an investigation of the Tongue River Reservoir shoreline in 1984. There were 4 previously recorded sites and seven newly recorded sites. Three of the newly recorded sites are on state land within the proposed project boundary: 24BH603, 24BH605, and 24BH607.
- Ethnoscience conducted investigations between 1992 and 1995 of the Tongue River Dam Project. In total, 41 prehistoric and 17 historic sites were located. Two previously recorded sites, 24BH605 and 24BH607 were investigated.

### **3.2.3 Hydrology (Issue #3)**

The Dietz project area lies entirely within the Tongue River Watershed. A series of intermittent drainages network the project area, of which Deer Creek is the only named drainage. Corral Creek is located immediately north of the project area. The nearest permanent water source is the Tongue River, which is located just west of the project area. An examination of U.S. Geological Survey (USGS) topographic maps and Bureau of Land Management documents do not indicate the presence of springs within the project area.

#### **3.2.3.1 Surface Waters**

The Tongue River Watershed covers approximately 1477 square miles. It originates in the Big Horn Mountains in Wyoming and runs north and is perennial throughout its length to the Yellowstone River. There are many tributaries to the Tongue River, including Anderson Creek, Deer Creek, and Corral Creek, all of which are near the project area.

An evaluation of USGS 7.5 minute topographic maps and a review of existing water rights of the project area revealed that no natural or developed springs exist inside the project boundary. Two direct flow surface water rights were permitted within the project area. Both belong to the Montana State Board of Land Commissioners. One is located in NE of Section 25 and the other in NW of Section 36.

Fidelity Exploration and Production Company has two existing MPDES permits for water discharge into the Tongue River. Permit MT0030457 authorizes untreated water discharge into the Tongue River through 15 approved outfalls. Limitations for Total Suspended Solids (TSS), pH, and flow rate are outlined in

detail in the discharge permit. In addition to those limitations, MDEQ has also employed the following discharge limitations:

- Between November 1 and February 28, the total flows discharged from the fifteen outfalls shall not exceed 2500 gallons per minute (gpm);
- Between July 1 and October 31, the total flows discharged from the fifteen outfalls shall not exceed 1600 gpm. Additional flow restrictions will be applicable during this seasonal period. Total discharges to the upper reach of the Tongue River will be limited to 1000 gpm.
- Effluent pH shall remain between 6.5 and 9.0;
- When daily stream flow values are less than 35 cubic feet per second (cfs) as recorded at USGS gauging station 06306300, the permittee shall conduct daily instream monitoring of specific conductance and shall cease discharging if the measured specific conductance exceeds the following values on any two consecutive calendar days:

November 1 through March 1:	2500 $\mu$ S/cm
March 2 through October 31:	1500 $\mu$ S/cm

Permit MT0030724 authorizes the discharge of water from Fidelity's Tongue River Project Treatment Facility located in Township 9 South, Range 40 East, Section 33 [NE4] to the Tongue River through one approved outfall location. Limitations for Total Suspended Solids, Total Nitrogen, Sodium Adsorption Ratio (SAR), Specific Conductance, and Heat Load are outlined in detail in the discharge permit. In addition to those limitations, MDEQ has also employed the following:

- Between November 1 and March 1 the instantaneous maximum flow discharged shall not exceed 1700 gallons per minute;
- During the period specified above, the percentage of untreated produced water shall not exceed 23% of the produced water delivered to the facility;
- Between March 2 and October 31 the instantaneous maximum flow discharged shall not exceed 1700 gallons per minute;
- During the period specified above, the percentage of untreated produced water shall not exceed 14% of the produced water delivered to the facility;
- Effluent pH shall remain between 6.5 and 9.0.

### 3.2.3.2 Ground Water

The sands and coals of the Fort Union formation are a major source of groundwater in the project area. Wells within these formations could produce as much as 40 gpm, but typically yield closer to 15 gpm. This formation is generally encountered at depths from 50 feet to 600 feet in the project area. Fidelity Exploration and Production Company has focused on the Dietz, Monarch, and Carney seams of the Fort Union Formation. As part of this proposal, Fidelity has also proposed to explore the deeper coals such as the Carlson, King, and Roberts.

Potentiometric surface maps representing current groundwater conditions near the project area indicate a regional groundwater flow direction generally to the west and southwest. It is suggested that Tongue River Reservoir and Decker Mine operations exert some hydraulic control on the groundwater conditions with the upper coal units.

A groundwater rights search was done for the entire proposed area of development. There are fourteen permitted wells within a one mile radius of the

project area and water well mitigation agreements have been offered to each water user.

#### **3.2.4 Lands and Realty (Issue #4)**

The surface of the common schools tracts within the POD have an active grazing lease issued to Decker Coal Company with an expiration date of February 28, 2017. The total AUMs for the common schools land in section 25 is 36 and the total AUMs for land in section 36 is 81, based on 2006 field evaluations.

An Easement Application for an underground 3-phase distribution powerline was submitted by PRE Corp in association with the Corral Creek Plan of Development. The easement area would extend a total distance of 5556.36 feet or 336.75 rods, more or less with a tract or strip of land 20 feet wide, 10 feet on each side of the centerline as described in the application. Separate approval would be needed for the easement.

#### **3.2.5 Soils (Issue #5)**

General soil information for the Corral Creek project area was submitted in the Plan of Development in March 2008. Soils in the POD area were developed in alluvium and residuum derived from the Tongue River member of the Tertiary Fort Union Formation and the Eocene Wasatch Formation. Lithology consists of light to dark yellow and tan siltstone and sandstones with coal seams in a matrix of shale. In many areas the near surface coals have burned, baking the surrounding rock, producing clinker or scoria. Higher ridges and hills are often protected by an erosion-resistant cap of clinker or sandstone. Thirteen soil series, which were grouped into 16 mapping units are present in the project area. Textures range widely, from clay to sandy loam.

Four different soil series were identified within the state tracts where development is proposed through the use of the Natural Resource Conservation Service (NRCS). The Thedalund-Wibaux stony loams, hilly (THn) is the most predominant series on the state tracts. It consists of moderately undulating to very steep, well-drained soils in the sedimentary uplands. It is formed in material weathered in place from shale. Permeability is moderate and available water capacity is low to moderate. These soils are suited for range, watershed, and game range. Runoff is rapid and the hazard of erosion is severe.

The Hesper silty clay loam (Hma) consists of deep, nearly level to gently sloping, well-drained soils. These soils formed in calcareous, wind and water transported silt and very fine sand. It has 0 to 1 percent slopes and is on high terraces and benches. Runoff is slow, and the erosion hazard is slight. This soil series is suited for most irrigated and dryland crops.

The Travessilla-Thedalund loams, rolling (TS) is made up of rolling hills and ridges in the sedimentary uplands. It is about 40 percent Travessilla loam and sandy loam, 40 percent Thedalund loam, and 15 percent Rock outcrop. Slopes are 8 to 15 percent. Runoff is medium, and the hazard of erosion is moderate. The soils formed from material weathered in place from calcareous hard sandstone. Permeability is rapid, and available water capacity is very low.

The final series found on the state tracts is the Chugter complex (CG). It consists of gently sloping to strongly sloping soils on fans, foot slopes, and terraces in red, burned shale uplands. It is about 60 percent Chugter loam, 25 percent Wibaux loam, and 15

percent Spearman and Hydro soils. The Hydro soil is in the valley bottoms. The Wibaux and Spearman soils are on spur ridges and knolls surrounded by the Chugter soil. Runoff is medium, and the hazard for erosion is moderate. These soils are used mainly for range, wildlife, and watershed. Small areas of the Chugter soil are used for dry-farmed crops and hay where slopes are less than 12 percent.

### **3.2.6 Vegetation (Issue #6)**

The project area is part of the Central Grasslands (Ethnoscience, 2007). The primary species found in this area include western wheatgrass, prairie junegrass, big sagebrush, and silver sagebrush. Ground visibility is approximately 0 to 30 percent. Also, numerous clinker deposit outcrops are located within and around the project area which are associated with specific plant species including ponderosa pine, juniper, skunkbush sumac, currant, and chokecherry. Field evaluations for the common schools lands within the POD area were completed in 2006. The species and composition around the wells pads and proposed infrastructure for the tracts is detailed in Table 3 and Table 4 below.



Table 3

*Vegetation species and composition on common schools land in section 25*

COMMON NAME	SCIENTIFIC NAME	COMPOSITION
Western Wheatgrass	Agropyron smithii	10%
Bluebunch Wheatgrass	Agropyron spicatum	
Green needlegrass	Stipa viridula	5%
Prairie snadreed	Calamovilfa longifolia	5%
Sideoats grama	Boutelous curtipendula	
Others		
Trees and Shrubs		5%
Needleandthread	Stipa comata	10%
Prairie Junegrass	Koeleria cristata	10%
Sandbergs bluegrass	Poa sandbergii	
Blue grama	Bouteloua gracilis	5%
Threadlead sedge	Carex filifolia	5%
Red threeawn	Aristida longiseta	
Plains Muhly	Muhlenbergia cuspidate	
Big Sagebrush	Artemisia tridentate	10%
Forbs		10%
Plains pricklypear	Opuntia polyantha	10%
Broom snakeweed	Gutierrezia sarothrae	
Others		
Kentucky Bluegrass	Poa pratensis	5%
Cheatgrass	Bromus tectorum	10%

Table 4

*Vegetation species and composition on common schools land in section 36*

COMMON NAME	SCIENTIFIC NAME	COMPOSITION	
		Site One	Site Two
Western Wheatgrass	Agropyron smithii	20%	-
Bluebunch Wheatgrass	Agropyron spicatum		
Western Wheatgrass	Agropyron smithii	-	5%
Green needlegrass	Stipa viridula		
Great basin wildrye	Elymuc cinereus		
Green needlegrass	Stipa viridula	5%	-
Trees and Shrubs		5%	5%
Needleandthread	Stipa comata	15%	25%
Prairie Junegrass	Koeleria cristata	5%	10%
Sandbergs bluegrass	Poa sandbergii		
Blue grama	Bouteloua gracilis	5%	5%
Threadlead sedge	Carex filifolia	5%	5%
Red threeawn	Aristida longiseta		
Forbs		15%	10%
Plains pricklypear	Opuntia polyantha	10%	10%
Broom snakeweed	Gutierrezia sarothrae		
Others			
Cheatgrass	Bromus tectorum	10%	10%

A search of the Montana Natural Heritage Program's Plant Species of Concern List revealed no element occurrences on state lands (Montana Natural Heritage Program, 2003). No state listed noxious weeds were discovered by a search of inventory maps, databases, or field evaluations.

### **3.2.7 Wildlife (Issue #7)**

Fidelity Exploration and Production contracted Hayden-Wing Associates, LLC (HWA) to conduct wildlife and habitat evaluations for the Corral Creek POD. In 2003, 2004, and 2005, HWA conducted surveys as part of baseline and monitoring requirements for other Fidelity PODs in the area, including aerial surveys for wintering bald eagles, ground surveys for greater sage-grouse leks and ground surveys of sharp-tailed grouse leks, aerial and ground surveys for raptor nests, and aerial surveys of mule deer within designated winter range.

During 2006, HWA conducted surveys in and around Corral Creek. Wildlife species surveyed included: wintering bald eagles, wintering mule deer, greater sage grouse, sharp tailed grouse, raptor nests, burrowing owl nests, mountain plover habitat and presence/absence of mountain plover, black-tailed prairie dog colonies, and potential sage-grouse nesting habitat. HWA conducted additional surveys on the species in 2007.

#### **3.2.7.1 Raptors**

Aerial surveys were conducted on January 9 and 30, and February 19, 2007 to locate bald eagle winter roost sites and identify potential winter roost habitat in or within one mile of the proposed POD. Two bald eagles were observed perched in a dead ponderosa pine located just north of the POD in the NE4 of Section 25. However, no active bald eagle nests are located in or within one mile of the Corral Creek POD.

Four raptor nests were located within the POD boundary. These include two Red Tailed Hawk nests, one in NENW of Section 2, and one in the SESE of Section 1, a Great Horned Owl nest in the SESW of Section 2 and a Burrowing Owl in the NE4 of Section 1. The Burrowing Owl is on the Montana Animal Species of Concern List (Montana Natural Heritage Program, 2004).

Two additional Red Tailed Hawk nests, one Great Horned Owl nest, and one Osprey nest were located with the one mile buffer of the project area.

#### **3.2.7.2 Prairie Dogs**

Two prairie dog colonies were located within the project boundary. One is almost entirely within the POD boundary and covers approximately 144.4 acres. The second is entirely within the POD boundary and covers approximately 1.4 acres. Portions of each colony are located on state land.

According to the USFWS guidelines for determining suitable black-footed ferret habitat, a black tailed prairie dog complex is defined as an aggregation of two or more neighboring prairie dog colonies separated by a distance of less than 4.34 miles and totaling 80 acres or more. The two towns within this POD area and its 0.5 mile buffer meet these criteria and would be considered suitable habitat for black-footed ferrets.

#### **3.2.7.3 Mountain Plover**

No potential mountain plover habitat was identified in or within ½ mile of the project boundary. Although two prairie dog colonies occur within the POD, the

area was determined to be unsuitable for mountain plover due to matted grass, closely spaced plants, lack of bare ground, presence of killdeer, and proximity to a large body of open water.

#### 3.2.7.4 Greater Sage Grouse and Sharp Tailed Grouse

There are no sharp tailed grouse leks or sage grouse leks within the POD boundary. The closest lek is a sharp tailed grouse lek in Section 8 of Township 9 South, Range 41 East. It is approximately 1 ½ miles from the POD boundary.

#### 3.2.7.5 Big Game

There is no crucial mule deer winter range habitat within the POD boundary. However, most of the POD was surveyed because of its proximity to the winter range. No mule deer sightings were recorded within the POD boundary during the three big game aerial surveys conducted. The nearest mule deer sightings occurred over ½ mile south of the POD.

#### 3.2.7.6 West Nile Virus

West Nile Virus is a mosquito borne disease that could cause encephalitis and other brainstem diseases in humans and a major impact on vertebrate wildlife populations (Bureau of Land Management, 2005). It is spread when mosquitoes feed on infected birds and then people or other birds or animals. It is not spread by person to person contact and there is no evidence that people can contract the virus by handling infected animals. Mosquitoes could potentially breed in any standing water that lasts for more than 4 days, including the Tongue River Reservoir.

### 3.2.8 Social and Economic (Issue #8)

Coal bed natural gas production is currently developed on approximately 2924 acres of state land. Royalty revenue generated for the State through June 2008 for CBNG totaled \$4,626,485. Current royalty payments are approximately \$95,000 per month. This revenue comes from the Badger Hills POD area, the Dry Creek POD area, the Coal Creek POD area, the Deer Creek North POD area, and the SE4 of Section 36-Township 9 South, Range 39 East, which has wells that are communitized with state minerals. Some wells within the Dietz POD have begun producing, with additional wells to produce in the future. The additional Coal Creek wells approved as part of an amended POD in Township 9 South, Range 41 East, Section 16 have not been drilled yet. In addition, the Waddle Creek POD and Fork's Ranch POD have been approved and the wells have not yet been drilled.

A more in depth analysis of the social and economic conditions of the project area can be found in Chapter 3: Affected Environment, and the Socioeconomic appendix of the MT FEIS.

### 3.2.9 Noise (Issue #9)

The major sources of noise within the project area are localized vehicular traffic and light industry activity on the existing roadways leading to the project area. Watercraft traffic on the Tongue River Reservoir could also impact noise levels during spring and summer months. These noise sources currently create only modest sound disturbances within the area.

### 3.2.10 Aesthetics (Issue #10)

This project area is visible from the Tongue River Reservoir and lands to the west of the reservoir at Rattlesnake Point.

### **3.2.11 Recreation (Issue #11)**

The Tongue River Reservoir receives an average of 80,000 visitors per year. This area has exceptional recreational opportunities that vary with seasonal changes. Spring and summer provide opportunities for fishing, hiking, photography, wildlife viewing, water sports, off road vehicle activities, camping, picnicking, touring, etc. Early to late fall is hunting season. Winter brings skiing, snowshoeing, and snowmobiling. This project area lies directly across the reservoir from Rattlesnake Point, a highly recreated campground on the west side of Tongue River Reservoir.

## CHAPTER 4 AFFECTED ENVIRONMENT

### 4.1 Introduction

This chapter forms the scientific and analytic basis for the summary comparison of effects presented in Chapter 2 of this Environmental Assessment. This chapter describes the environmental consequences or effects of the proposed action and the cumulative effects of concurrent and future state activities within the analysis areas.

### 4.2 Predicted Attainment of Project Objectives of all Alternatives

#### 4.2.1 Predicted Attainment of Project Objective #1: Develop a coal bed natural gas project in southeastern Montana encompassing federal, fee and state mineral development.

##### 4.2.1.1 Alternative A: No Coal Bed Natural Gas Development (No Action)

Under this alternative, coal bed natural gas development would continue on fee lands adjacent to the state tracts in the project area. Federal minerals could also be developed. The state tracts lie in an area with high probability of additional coal bed natural gas development. Natural gas from the coal beds on the undeveloped state tracts would be drained and produced without adequate compensation from offset wells drilled on the adjacent sections.

##### 4.2.1.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)

Under this alternative, coal bed natural gas development would occur on the fee and state tracts concurrently, providing a more reasonable, efficient, and systematic means of developing the gas field. Federal mineral development could also occur. Facilities and infrastructure could be minimized by joint development. In addition, concurrent development of the state tracts would prevent drainage and protect correlative rights of the state, thereby ensuring the state receives payment for the minerals removed from the state tracts.

#### 4.2.2 Predicted Attainment of Project Objective #2: Operate federal, state and fee wells collectively, sharing facilities constructed and operating on the leases.

##### 4.2.2.1 Alternative A: No Coal Bed Natural Gas Development (No Action)

Under this alternative, fee wells would be operated independently of state activity. Federal minerals could also be developed. As a result, if development of these state tracts were to be considered at a later date, additional facilities and infrastructure could be required on the state surface in order to produce the wells.

##### 4.2.2.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)

Under this alternative, fee and state minerals would be operated concurrently, eliminating the need of unnecessary land disturbances and additional infrastructure. Federal minerals could also be developed.

#### 4.2.3 Predicted Attainment of Project Objective #3: Increase the revenue generated for the State of Montana school trust fund.

##### 4.2.3.1 Alternative A: No Coal Bed Natural Gas Development (No Action)

Under this alternative, economic contribution to the school trust would be minimal. Communitization agreements would be executed based on Montana Board of Oil and Gas Conservation spacing for the CX field. The current lease rentals and revenue from the grazing lease would continue. However, this would have a direct effect upon the TLMD's fiduciary obligation to generate revenue for the beneficiaries of the school trust fund. Development would continue around the state tracts, allowing drainage of state minerals without fair compensation. This would reduce, or even eliminate, the potential for development of the state minerals in the future.

#### 4.2.3.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)

Under this alternative, eight wells would be drilled on the state tracts. This would positively impact local and state tax revenue. The state school trust would receive royalty revenue equivalent to 12.5% of the gross value of the produced natural gas from the common schools tracts in section 36 and section 25. Water Resources Division would receive 12.5% of the gross value of the natural gas produced from their tracts in Section 25, tracts in the east half of section 2 and tracts in section 1 due to 160 acre spacing established by MBOGC. In addition, WRD would receive 16.67% of the gross value of the natural gas produced from their tract in the west half of section 2. Based upon performance of wells in the CX field and reserve estimates from test wells within the POD, this would generate over \$2.77 million to the Common School Trust over the life of the project and \$1.5 million for Water Resources Division.

### 4.3 Predicted Effects on Relevant Affected Resources of All Alternatives

#### 4.3.1 Predicted Effects on Air Quality (Issue #1)

##### 4.3.1.1 Alternative A: No Coal Bed Natural Gas Development (No Action)

Direct and Indirect: There would be no direct or indirect impacts to air quality as a result of this alternative.

Cumulative: No cumulative impacts as a result of state activities. Development of minerals on fee lands would continue under the No Action alternative. Federal minerals could also be developed. The cumulative impacts are discussed and analyzed in BOGC's EA and the MT FEIS.

##### 4.3.1.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)

Direct and Indirect: Pollutant emissions would occur during the drilling phase of the eight wells on state land. Localized short term increases in CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> concentrations would occur. However, maximum concentrations are expected to remain well below the applicable state, local, and federal air quality standards. The Montana Department of Environmental Quality has regulatory authority to review and issue permits covering all new or modified air pollution emission sources. These permits would be required prior to construction.

The time to drill each of the eight coal bed natural gas wells on the state tracts would be approximately one to two days. Water well rigs would be utilized in lieu of traditional oil and gas drilling rigs due to the shallow depths of the coal seam targets. These smaller rigs do not have high horsepower engines so emissions would not be significant.

During the production phase of this project, vehicle traffic could result in an intermittent deterioration in air quality in the area. Dry conditions could cause a higher volume of dust in the air. There are no compressor stations proposed on state lands, so long term impacts would not occur as a result of state activities.

The following mitigation measures have been proposed for this alternative:

- Fidelity would install remote monitoring equipment to minimize the amount of vehicle traffic to and from the individual well sites. This would decrease the pollutant emissions during the production phase of the project.
- Speed limits would be implemented on unpaved roads throughout the POD area.
- The Montana Board of Oil and Gas Conservation regulates gas venting. They prohibit venting of commercial quantities of gas. Since extensive

infrastructure and testing is already in place in the CX Field, only a limited amount of testing would occur for a short duration prior to well hookup.

Cumulative: Cumulative impacts as a result of state activities have been analyzed in conjunction with fee development in BOGC's EA for this project. Ultimately, air quality is regulated by the Montana Department of Environmental Quality through the Clean Air Act.

#### **4.3.2 Predicted Effects on Cultural Resources (Issue #2)**

##### **4.3.2.1 Alternative A: No Coal Bed Natural Gas Development (No Actions)**

Direct and Indirect: There would be no direct or indirect impacts to cultural resources as a result of this alternative.

Cumulative: There would be no cumulative impacts to cultural resources as a result of state activities under this alternative.

##### **4.3.2.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)**

Direct and Indirect: Twenty-three cultural resource sites were identified in the project area. These sites include 21 prehistoric and two historic sites. The prehistoric sites include 10 stone feature sites and 11 lithic scatters. Three stone feature sites and two lithic scatter sites are recommended not eligible under Criteria A, B, and C. Additional work is necessary before eligibility recommendations under Criterion D could be provided. Two previously recorded lithic scatter sites no longer exist. Five stone feature sites and seven lithic scatter sites are recommended not eligible. The two historic sites are recommended not eligible. Fidelity would avoid all sites identified within the project area. Therefore, no impacts to cultural resources would occur as a result of any proposed activity.

The following mitigation measure would be enforced for this alternative:

- If any cultural values (sites, artifacts, human remains) are observed that were not previously addressed and reviewed, they would be left intact, operations halted, and the TLMD notified immediately. Fidelity is responsible for informing all persons in the area who are associated with this project that they would be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. TLMD would conduct an evaluation of the cultural values to establish appropriate mitigation, salvage, or treatment. If additional archaeological survey work is required, Fidelity would be responsible for this expense. This is a requirement in both the lease agreement and the Coal Bed Natural Gas Operating and Reclamation Requirements found in Appendix A of this report.

Cumulative: No cumulative impacts to cultural resources would occur as a result of state mineral development.

#### **4.3.3 Predicted Effects on Hydrology (Issue #3)**

##### **4.3.3.1 Alternative A: No Coal Bed Natural Gas Development (No Action)**

Direct and Indirect: There would be no direct or indirect impacts to hydrology as a result of this alternative.

Cumulative: The state would not contribute to cumulative impacts under this alternative. Development of fee minerals in the POD would continue. Federal lands could also be developed.

##### **4.3.3.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)**

Direct and Indirect: Fidelity currently produces water from 702 coal bed natural gas wells in the TRP area, of which 31 are Montana Department of Natural Resources

The proposed Corral Creek POD wells would have a 10 to 15 year life expectancy. Water production from the existing battery locations within CX field indicates that existing wells produce between 1 and 13 gallons per minute for single coal seam completions and/or between 5 and 6 gpm per coal seam for commingled well completions. Typically, decline rates for CBNG wells range from 5 to 39% per year, and Fidelity has assumed a 20% decline rate for existing and future production within the water balance (Tables 3-5).

Table 3.  
*2008 Fidelity Water Balance*

MONTANA					GPM	Gross Well Count	Net Well Count	Decline	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08
MT East Existing (Jan 2008)								20%	1,675	1,649	1,624	1,599	1,575	1,551	1,527	1,504	1,481	1,458	1,436	1,414
Decker Mine E. 16 wells (2007) - PRODUCING					18	16	16	20%	288	284	279	275	271	267	263	259	255	251	247	243
Coal Creek Fed 21 wells (2008) - DRILLED					25	21	21	20%			131	263	473	465	458	451	444	437	431	424
Deer Creek North Fed 34 wells (2008)					22	34	34	20%											187	374
Corral Creek 17 wells (2008) - STATE & FEE					22	17	17	20%									94	281	374	368
Coal Creek Amend Fed 31 wells (2009)					20	31	31	20%												
MT East Subtotal									1,963	1,933	2,035	2,137	2,318	2,283	2,248	2,213	2,273	2,426	2,674	2,823
MT West Existing (Jan 2008)									1,050	1,034	1,018	1,003	987	972	957	943	928	914	900	886
Total Flow									3,013	2,967	3,053	3,139	3,305	3,255	3,205	3,156	3,201	3,340	3,574	3,709
																		Avg. GPM 2008 A-Ft per year - 2008		3,243
MONTANA WATER BALANCE (GPM)																				5,189
Untreated Capacity to the River									2,500	2,500	2,375	2,375	2,375	2,375	1,600	1,600	1,600	1,600	2,500	2,500
EMIT 15									700	700	700	700	700	700	700	700	700	700	700	700
EMIT 19									730	730	730	730	730	730	730	730	730	730	730	730
Spring Ck Mine									120	120	120	120	120	175	370	370	370	370	250	120
Decker Mine									85	85	85	85	85	85	85	85	85	85	85	85
Total Capacity									4,135	4,135	4,010	4,010	4,010	4,065	3,485	3,485	3,485	3,485	4,265	4,135
Total Flow									3,013	2,967	3,053	3,139	3,305	3,255	3,205	3,156	3,201	3,340	3,574	3,709
Difference									1,122	1,168	957	871	705	810	280	329	284	145	691	426



Table 4  
*2009 Fidelity Water Balance*

	GPM	Gross Well Count	Net Well Count	Decline	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09
MONTANA																
MT East Existing (Jan 2008)				20%	1,392	1,371	1,350	1,329	1,309	1,289	1,269	1,249	1,230	1,211	1,193	1,175
Decker Mine E. 16 wells (2007) - PRODUCING	18	16	16	20%	239	236	232	229	225	222	218	215	212	208	205	202
Coal Creek Fed 21 wells (2008) - DRILLED	25	21	21	20%	418	411	405	399	393	387	381	375	369	363	358	352
Deer Creek North Fed 34 wells (2008)	22	34	34	20%	598	748	737	725	714	703	692	682	671	661	651	641
Corral Creek 17 wells (2008) - STATE & FEE	22	17	17	20%	363	357	352	346	341	336	331	326	321	316	311	306
Coal Creek Amend Fed 31 wells (2009)	20	31	31	20%										155	310	558
MT East Subtotal					3,010	3,123	3,075	3,028	2,981	2,936	2,891	2,847	2,803	2,915	3,028	3,234
MT West Existing (Jan 2008)					873	859	846	833	820	808	795	783	771	759	748	736
Total Flow					3,882	3,982	3,921	3,861	3,802	3,743	3,686	3,630	3,574	3,674	3,776	3,971
														Avg. GPM 2008 A-Ft per year - 2008		3,792
MONTANA WATER BALANCE (GPM)																6,067
Untreated Capacity to the River					2,500	2,500	2,375	2,375	2,375	2,375	1,600	1,600	1,600	1,600	2,500	2,500
EMIT 15					700	700	700	700	700	700	700	700	700	700	700	700
EMIT 19					730	730	730	730	730	730	730	730	730	730	730	730
Spring Ck Mine					120	120	120	120	120	175	370	370	370	370	250	120
Decker Mine					85	85	85	85	85	85	85	85	85	85	85	85
Total Capacity					4,135	4,135	4,010	4,010	4,010	4,065	3,485	3,485	3,485	3,485	4,265	4,135
Total Flow					3,882	3,982	3,921	3,861	3,802	3,743	3,686	3,630	3,574	3,674	3,776	3,971
Difference					253	153	89	149	208	322	(201)	(145)	(89)	(189)	489	164

Table 5  
2010 Fidelity Water Balance

	GPM	Gross Well Count	Net Well Count	Decline	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10
MONTANA																
MT East Existing (Jan 2008)				20%	1,157	1,139	1,122	1,104	1,087	1,071	1,054	1,038	1,022	1,007	991	976
Decker Mine E. 16 wells (2007) - PRODUCING	18	16	16	20%	199	196	193	190	187	184	181	179	176	173	170	168
Coal Creek Fed 21 wells (2008) - DRILLED	25	21	21	20%	347	342	337	331	326	321	316	312	307	302	297	293
Deer Creek North Fed 34 wells (2008)	22	34	34	20%	631	622	612	603	593	584	575	567	558	549	541	533
Corral Creek 17 wells (2008) - STATE & FEE	22	17	17	20%	301	297	292	288	283	279	275	270	266	262	258	254
Coal Creek Amend Fed 31 wells (2009)	20	31	31	20%	549	541	533	525	517	509	501	493	486	478	471	464
MT East Subtotal					3,185	3,136	3,088	3,041	2,994	2,948	2,903	2,859	2,815	2,772	2,729	2,688
MT West Existing (Jan 2008)					725	714	703	692	682	671	661	651	641	631	621	612
Total Flow					3,910	3,850	3,791	3,733	3,676	3,619	3,564	3,509	3,456	3,403	3,351	3,299
														Avg. GPM 2008 A-Ft per year - 2008		3,597
MONTANA WATER BALANCE (GPM)																5,755
Untreated Capacity to the River					2,500	2,500	2,375	2,375	2,375	2,375	1,600	1,600	1,600	1,600	2,500	2,500
EMIT 15					700	700	700	700	700	700	700	700	700	700	700	700
EMIT 19					730	730	730	730	730	730	730	730	730	730	730	730
Spring Ck Mine					120	120	120	120	120	175	370	370	370	370	250	120
Decker Mine					85	85	85	85	85	85	85	85	85	85	85	85
Total Capacity					4,135	4,135	4,010	4,010	4,010	4,065	3,485	3,485	3,485	3,485	4,265	4,135
Total Flow					3,910	3,850	3,791	3,733	3,676	3,619	3,564	3,509	3,456	3,403	3,351	3,299
Difference					225	285	219	277	334	446	(79)	(24)	29	82	914	836

The water balance forecasts produced water volumes through 2010 and includes all existing production east and west of the Tongue River, existing Decker Mine East production, future development of 21 federal Coal Creek POD wells, future development of 24 federal Deer Creek North Amended POD wells, future development the 17 state and fee wells as proposed in this Corral Creek POD, and future development of 31 Coal Creek federal Amended POD wells. It does not include the 8 federal wells in Amended Badger Hills POD, 13 federal wells in Decker Mine East POD, 33 federal wells in Deer Creek North POD, or 6 federal wells in this proposed Corral Creek POD.

Treated discharge volumes through 2010 assume approximately 1430 gallons per minute, leaving approximately 270 gpm of treated capacity available. Also, roughly 2.5 to 5% of produced water would be utilized internally by Fidelity for well drilling and completion, facility construction, dust suppression, and related activities. This water management component is not included in the water balance forecast.

Several capacity deficits are identified within forecast and include:

- July through October of 2009 with deficits ranging from 89 to 201 gpm
- July through August of 2010 with deficits of 79 gpm and 24 gpm, respectively.

Fidelity would be able to manage these deficits by reducing produced water flows from select wells and project areas, and/or utilizing the remaining treated discharge capacity (approximately 270 gpm) available under MPDES Permit MT0030724.

Cumulative Impacts: The two principal constituents of CBNG water that present the greatest concern are SAR and salinity (Horpestad & Skaar, 2001). Depending on the relative amounts of these two constituents and the makeup of the soil, direct discharge of CBNG water onto the surface could result in deterioration of soil hydraulic characteristics and decrease of crop production as the energy that the crops need to extract the water from the soil increases. Thresholds for SAR and salinity have not become standard, as the affects are very site specific. However, the MPDES permits have water quality standards that must be adhered to. The Corral Creek POD water management plan incorporates water treatment prior to discharge in addition to untreated water discharge. No water discharge would occur on the state section. Discharge to waters of the state is regulated by MDEQ. Other beneficial use is at the discretion of the landowners and subject to any applicable regulations. Additional information regarding the cumulative impacts can be found in the MT FEIS and the Corral Creek POD EA completed by MBOGC.

#### **4.3.4 Predicted Effects on Lands and Realty (Issue #4)**

##### **4.3.4.1 Alternative A: No Coal Bed Natural Gas Development (No Action)**

Direct and Indirect: There would be no direct or indirect impacts to lands and realty as a result of state activity under this alternative. The existing surface grazing lease would not be impacted and there would be no effects to the available grazing land. Grazing patterns would not change. The state would still receive its share of royalties for gas production due to communitization agreements with federal and fee mineral owners based on MBOGC established 160 acre spacing for CX field.

Cumulative: Under this alternative, no cumulative impacts would occur as a result of state activities.

##### **4.3.4.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)**

Direct and Indirect: Under this alternative, the existing surface grazing lease and oil and gas leases would remain in effect. Total lands available for grazing purposes

would be reduced by approximately 15 acres during the construction phase. However, this would be short term. After the wells have been completed and the temporary disturbance reclaimed, the total area unavailable for grazing would be approximately 10 acres.

Cumulative: Under this alternative, no cumulative impacts would occur to the lands and realty as a result of state activity. The increase in produced water could serve as a beneficial use to our surface lessee. If such beneficial use was proposed for the state tracts, that proposal would have to be reviewed and approved by the Department.

#### **4.3.5 Predicted Effects on Soils (Issue #5)**

##### **4.3.5.1 Alternative A: No Coal Bed Natural Gas Development (No Action)**

Direct and Indirect: Under this alternative, no coal bed natural gas development would occur on state lands. As a result, no impacts to soils would occur. The existing surface grazing lease would remain in effect which would allow for the continuing harvest of vegetation on state lands. The proposed route through the state tract would have to be revised to a location that does not impact state lands.

Cumulative: Under this alternative, no cumulative impacts would occur as a result of state activities.

##### **4.3.5.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)**

Direct and Indirect: Under this alternative, the project area would be developed as proposed in the POD. Eight separate well pads would be constructed for the purpose of drilling eight coal bed natural gas wells. It is estimated that each pad site would disturb approximately one acre for vehicle activity, temporary storage of equipment and drilling and completion. Topsoil would be moved and stockpiled prior to pad construction. A 15' by 15' pit would be constructed on each well pad to contain drilling fluids. Upon completion of the well, the fluids will be evaporated or removed and the pit reclaimed. The surface facilities would be enclosed by an insulated, fiberglass cover approximately 5'x5'x4' and a pump panel enclosed in a three-rail welded fence panel (approximately 16'x12'). The area within the panels would be graveled and the rest would be reclaimed according to the Coal Bed Natural Gas Operating and Reclamation Requirements located in Appendix A of this report. Less than ¼ acre total would be disturbed for all eight state well pads.

Drilling and completion of the wells under Alternative B may cause minimal compaction, erosion, and soil quality degradation. Topsoil removal reduces the soil quality on the well sites. The longer the soil remains exposed to the atmosphere and adverse weather conditions, the more likely erosion would occur (Muckel, 2004). Some of the soils present on the state tracts have moderate to extreme erosion hazards. The erosion rate is increased when accompanied by high winds and rain periods. The following mitigation measures would be enforced to minimize soil damage and erosion:

- Construction would be restricted to dry or frozen conditions
- Excavation of the well pad would be done immediately before construction instead of exposing the soil for long durations
- The disturbed soils would be covered with vegetation or mulch as soon as possible
- Roads and pads would not be constructed in or near drainages
- Other requirements are outlined in Appendix A.

In addition to the eight well pads, a two track trail would run from the south of section 36 to the state well location in the NESE of Section 25. Three two track trails would be constructed off this main two track to access other wells in section 36. In addition, a two track trail would be used to access the state water resources well in the NENW of Section 2. The water, gas, and underground power lines would be installed in a common corridor to reduce the potential for erosion, compaction, and soil quality deterioration. In all cases, the utility corridors would lie along the two track trails and existing roads. Total new land disturbance during the construction phase for the two track trails would be approximately 10.47 acres. In general, vehicle travel could compact the soil. Depending on the amount of compaction, infiltration could be decreased and the potential for runoff and erosion could increase. Compaction potential is increased in wet conditions. The following mitigation measures would be enforced:

- Vehicle travel restricted to dry or frozen conditions
- Vehicle travel limited to approved routes only

Additional mitigation measures can be found in the Coal Bed Natural Gas Field Operating and Reclamation Requirement in Appendix A of this report.

Cumulative: State and local laws and the Clean Water Act require erosion and sediment control plans be developed prior to construction. Montana Department of Environmental Quality has the regulatory authority over water quality issues and they would address specific issues when necessary.

#### **4.3.6 Predicted Effects on Vegetation (Issue #6)**

##### **4.3.6.1 Alternative A: No Coal Bed Natural Gas Development (No Action)**

Direct and Indirect: No direct or indirect effects on vegetation would occur to state land as a result of this alternative.

Cumulative: No cumulative impacts to vegetation would occur as a result of state activities under this alternative.

##### **4.3.6.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)**

Direct and Indirect: Well pad construction, road construction, and infrastructure would require that the vegetation and topsoil be removed on approximately 15 acres of state lands. This would temporarily reduce the amount of vegetation available to livestock and wildlife. The impacts to vegetation from vehicle travel would include plant growth restriction due to soil compaction and the increased potential for introduction of noxious weeds to the surface. In addition, the well pad disturbance would remove vegetation temporarily until reseeding is complete. However, some of the total disturbance would be short term and reclaimed upon completion of the construction phase.

Cumulative: A reduction in the vegetation amount and quality would reduce the number of acres of land available for grazing. However, some disturbance is short term and minimal.

#### **4.3.7 Predicted Effects on Wildlife (Issue #7)**

##### **4.3.7.1 Alternative A: No Coal Bed Natural Gas Development (No Action)**

Direct and Indirect: No direct or indirect impacts would occur as a result of state activities under this alternative.

Cumulative: There would be no cumulative impacts as a result of state activity under this alternative. Fee minerals would be developed in the remainder of the POD area. Federal minerals could also be developed. The cumulative impacts for the project area are discussed and analyzed in the BOGC EA for the Corral Creek POD.

##### **4.3.7.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)**

#### 4.3.7.2.1 Raptors

Direct and Indirect: During the wildlife survey, four raptor nests were located within the project area and four additional nests were found within the one mile buffer of the project area. The State 21M/C/W-0290 well location and access road are within the ¼ mile buffer of the Red tailed hawk nest in NENW of Section 2. In order to mitigate impacts to the nest, the following stipulations would be enforced:

- The State 21M/C/W-0290 well location must be relocated outside the ¼ mile buffer of the Red tailed hawk nest or the well cannot be drilled as long as the nest remains active.
- No Surface Occupancy (NSO) from March 1 through August 1 within ½ mile of the red tailed hawk nest. This means all surface disturbances within the ½ mile buffer must be completed outside of the timing restrictions.
- All above ground power electrical poles and lines would be raptor proofed to avoid electrocution following the criteria outlined in the Avian Power Line Interaction Committee (APLIC) (1994) and APLIC (1996). One approved above ground pole would be located on state land. All other powerlines would be buried.

No other state wells in the project area are within the one mile buffer of any raptor nest.

Cumulative: The cumulative impacts to raptors from the development of the project area may include direct habitat loss and displacement due to infrastructure and human disturbance. However, due to remote monitoring and stipulations, the impacts would be minimal and short lived.

#### 4.3.7.2.2 Prairie Dogs

Direct and Indirect: Two prairie dog towns were identified in the project area. The largest is 144.4 acres and includes parts of Section 36 and Section 1. There is an existing test well on the edge of the dog town. The proposed actions include a two track trail and utility corridor running through the prairie dog town. Impacts to the prairie dog town would be minimal. No additional well pads would be located within the boundary of the prairie dog town.

Cumulative: No cumulative impacts to the prairie dog towns within and adjacent to this project would occur. More detailed information on cumulative impacts to prairie dog towns can be found in the Programmatic EIS.

#### 4.3.7.2.3 Mountain Plover

Direct and Indirect: No potential mountain plover habitat was identified in or within ½ mile of the project boundary. Although two prairie dog colonies occur within the POD, the area was determined to be unsuitable for mountain plover due to matted grass, closely spaced plants, lack of bare ground, presence of killdeer, and proximity to a large body of open water. Therefore, there would not be any significant impact to mountain plover as a result of this proposal.

Cumulative: No cumulative impacts will occur as a result of this proposal. This areas was determined to be unsuitable for mountain plover.

#### 4.3.7.2.4 Greater Sage Grouse and Sharp Tailed Grouse

Direct and Indirect: The most common impacts to sage grouse and sharp tailed grouse due to CBNG development are human disturbance and habitat alteration. One sharp tailed grouse lek lies within the two mile buffer of the project area. This location is approximately 2 ½ miles from any proposed development on the state tracts within the POD. The impact to grouse would be minimal as a result

of state activities. The following mitigation measure would be enforced, if necessary, to minimize the impacts to sharptail and sage grouse leks:

- A No Surface Occupancy (NSO) within ¼ mile of the known leks
- A No Surface Occupancy (NSO) between March 1 and June 15 in grouse nesting habitat within 2 miles of a known lek.

Cumulative: Increase activity in the vicinity of sage grouse leks and sharp tailed grouse leks may affect this species through human disturbance and habitat alteration.

#### 4.3.7.2.5 Big Game

Direct and Indirect: Mule deer, elk, and antelope may be impacted by habitat fragmentation, habitat disturbance, and human disturbance. The state tracts do not lie within crucial winter range habitat. The impacts to big game would be short term while well drilling and infrastructure construction is occurring. The loss of vegetation as a result of construction operations could also impact populations. As the production phase is implemented and restoration of the disturbed well sites is complete, deer would likely return to the area.

Cumulative: Disturbance by activity and construction activities is short term for big game and the populations would be effected only temporarily. It is anticipated that populations would return to the area in the production phase of this project.

#### 4.3.7.2.6 West Nile Virus

There is a potential to increase mosquitoes habitat with this alternative through the discharge of water into the Tongue River. As a result, cases of West Nile Virus could increase. However, many other factors could also affect the spread of disease, such as the nearness of the Tongue River Reservoir, irrigation adjacent to the Tongue River, natural wetlands, stock water impoundments, and environmental influences. In the event that state and/or county health and human service and/or public pest management agencies indicate that mosquito control is needed, TLMD would require Pinnacle to take adequate control measures.

### 4.3.8 Predicted Effects on Social and Economic Factors (Issue #8)

#### 4.3.8.1 Alternative A: No Coal Bed Natural Gas Development (No Action)

Direct and Indirect: Under this alternative, state minerals would not be developed. As a result, economic contribution to the school trust and WRD would be limited to the current lease rentals and royalties generated pursuant to communitization agreements that will be executed based on MBOGC established 160 acre spacing for CX field. This would have a direct effect upon the TLMD's fiduciary obligation to generate revenue for the beneficiaries of the school trust fund. Development would continue around the state tracts, allowing drainage of state minerals. This would reduce or eliminate the potential for development of state minerals in the future.

Cumulative: There would still be an increase in state and local taxes due to coal be natural gas development from the fee minerals. The state would receive some royalties based on communitization agreement for several of the tracts within the project area. There would be little difference in employment opportunities between the two alternatives.

#### 4.3.8.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)

Direct and Indirect: Under this alternative, eight wells would be drilled on the state tracts. This would positively impact local and state tax revenue. The state school trust would receive royalty revenue equivalent to 12.5% of the gross value of the

produced natural gas from the common schools tract in section 36 and 16.67% of the gross value from the common schools tract in section 25. Water Resources Division would receive 12.5% of the gross value of the natural gas produced from their tracts in Section 25, tracts in the east half of section 2 and tracts in section 1 due to 160 acre spacing established by MBOGC. In addition, WRD would receive 16.67% of the gross value of the natural gas produced from their tract in the west half of section 2. Based upon performance of wells in the CX field, which is southeast of this project, this would generate over \$2 million to the Common School Trust over the life of the project and over \$170,000 for Water Resources Division.

Cumulative: There would be an increase in the state and local taxes due to coal bed natural gas development of state and fee minerals. The increase in production would create a minimal increase in the number of jobs relating to the activity.

#### **4.3.9 Predicted Effects on Noise (Issue #9)**

##### **4.3.9.1 Alternative A: No Coal Bed Natural Gas Development (No Action)**

Direct and Indirect: There would be no direct or indirect impacts on noise as a result of state activities within this project area.

Cumulative: There would be no cumulative impacts as a result of state activity under this alternative. Fee minerals would be developed in the remainder of the POD area. Federal minerals could also be developed. The cumulative impacts for the project area are discussed and analyzed in the BOGC EA for the Corral Creek POD.

##### **4.3.9.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)**

Direct and Indirect: Exposure to increased noise levels as a result of drilling the wells on the state tracts would be short term and minimal. Water well type drilling rigs are used to drill the wells. They are smaller and have smaller engines than conventional oil or gas drilling rigs. In addition, CBNG rigs generally operate during daylight hours only. No compressors have been proposed on the state tracts within the project area.

Cumulative: There would be a short term increase in noise levels in the project area as a result of drilling the wells. Two new compressors are proposed in this POD, both own which would be less than 50 decibels measured at a distance of ¼ mile as required in the Programmatic EIS. However, there would be no cumulative impacts to noise levels as a result of state activities.

#### **4.3.10 Predicted Effects on Aesthetics (Issue #10)**

##### **4.3.10.1 Alternative A: No Coal Bed Natural Gas Development (No Action)**

Direct and Indirect: There would be no direct or indirect impacts as a result of state activities in the project area.

Cumulative: There would be no cumulative impacts as a result of state activity under this alternative. Fee minerals would be developed in the remainder of the POD area. Federal minerals could also be developed. The cumulative impacts for the project area are discussed and analyzed in the BOGC EA for the Corral Creek POD and the Programmatic EIS.

##### **4.3.10.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)**

Direct and Indirect: The wells on the state tracts within this project area would be located in valleys and draws that are not immediately visible from adjacent lands. Visual impacts such as color contrasts from facilities and exposed soil would be reduced through use of standard environmental colors, minimizing surface disturbance, and reclaiming disturbed areas with vegetative species native to the area.

Cumulative: There would be an increase in development of lands as a result of fee and federal development. This development could impact the

aesthetics in the area but due to the limited accessibility of the tracts within this POD, the impacts would be minimal.

#### **4.3.11 Predicted Effects on Recreation (Issue #11)**

##### **4.3.11.1 Alternative A: No Coal Bed Natural Gas Development (No Action)**

Direct and Indirect: There would be no direct or indirect impacts as a result of state activities in the project area.

Cumulative: There would be no cumulative impacts as a result of state activity under this alternative. Fee minerals would be developed in the remainder of the POD area. Federal minerals could also be developed. The cumulative impacts for the project area are discussed and analyzed in the BOGC EA for the Corral Creek POD and the Programmatic EIS.

##### **4.3.11.2 Alternative B: Coal Bed Natural Gas Development (Proposed Action)**

Direct and Indirect: Construction of roads, well pads, and facilities in the project area could detract from the quality of the Tongue River Reservoir recreational area. The drilling and completing of the wells on the state tract could temporarily displace wildlife that utilizes the areas, but any impact would be short term. Public access to the development area is limited, so impacts to the recreational opportunities on the state tract would be minimal. Public viewing of the activities would be possible during the drilling and construction phase of the project from the reservoir or adjacent lands.

Cumulative: There would be no cumulative impacts to recreation as a result of state activities. Additional information about recreation impacts can be found in Chapter 4 of the Programmatic EIS.



## CHAPTER 5 AGENCY CONSULTATION AND PUBLIC COMMENT

The following agencies were consulted throughout the development of this Environmental Assessment:

- Fidelity Exploration and Production
- Montana Fish, Wildlife, and Parks
- Bureau of Land Management – Miles City, MT Office
- Montana Board of Oil and Gas
- Western Land Services
- ALL Consulting

Public comment has been solicited via press release, website posting, and mail out to interested parties.

Prepared by: Bobbi Jo Coughlin, Petroleum Engineer, Minerals Management Bureau

/s/

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October 3, 2008

Approved by: Monte Mason, Chief, Minerals Management Bureau

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## APPENDIX A

### COAL BED NATURAL GAS FIELD OPERATING AND RECLAMATION REQUIREMENTS

\*DNRC refers to DNRC Trust Land Management Division (TLMD)

#### A. Notifications

- a. Notify the DNRC, Southern Land Office at least 48 hours prior to beginning any construction and/or drilling operations (406-247-4400).
- b. Any variances from the following guidelines or the site specific stipulations must be approved by DNRC.
- c. The lessee (lessee includes lessee, operator, contractors, or any other agent conducting activities on lease premises pursuant to authority conveyed by the state lessee ) shall obtain approval prior to construction of any new surface disturbing activities that are not specifically addressed in the approved operating plan or POD Surface Use Plan.
- d. Phased reclamation plans will be submitted to DNRC for approval prior to individual POD facility abandonment.
- e. A notice of Intent to Abandon must be submitted for approval. Upon completion of plugging, a copy of the Subsequent Report of Abandonment must also be submitted.
- f. If any cultural values (sites, artifacts, human remains) are observed that were not previously addressed, reviewed, and approved by DNRC, they will be left intact, operations stopped, and the DNRC notified immediately. The lessee is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. DNRC will conduct an evaluation of the cultural values to establish appropriate mitigation, salvage, or treatment. If additional archaeological survey work is required, lessee will be responsible for this expense.

#### B. Construction

- a. Vehicle Travel:
  - i. Construction and other project related traffic will be restricted to approved routes. Cross country vehicle travel will not be allowed.
  - ii. Maximum speed on all lessee constructed and maintained roads will not exceed 25 miles per hour.
  - iii. The lessee shall restrict travel on unimproved two-track roads during periods of inclement weather or spring thaw when the possibility exists for excessive surface resource damage (e.g. rutting in excess of 4 inches, travel outside two-track roadway, etc). This applies to pre-approval APD-POD planning (surveying, staking), drilling, production, and reclamation operations.
- b. Construction activities can only occur pursuant upon DNRC written approval of the operating plan.
- c. All construction activities for off wellpad facilities will be addressed in an operation plan submitted by the operator.
- d. Soil:

- i. Stockpiled topsoil and pit material must be stored to prevent material from entering drainages.
  - ii. Equipment cannot be stored on the topsoil stockpile.
  - iii. The lessee will limit vegetation removal and the degree of surface disturbance, utilizing all practicable measures to minimize erosion and stabilize disturbed soils.
  - iv. Topsoil will be salvaged for use in reclamation on all areas of surface disturbance (roads, locations, pipelines, etc). Clearly segregate topsoil from excess spoil material.
  - v. The lessee will not push soil material and overburden over side slopes or into drainages. All soil material disturbed will be placed in an area where it can be retrieved without creating additional undue surface disturbance and where it does not impeded watershed and drainage flows.
  - vi. Construct the backslope no steeper than  $\frac{1}{2}$ :1, and construct the foreslope no steeper than 2:1 unless otherwise directed by DNRC.
  - vii. Maintain a minimum 20 foot undisturbed vegetative border between toe of fill pad and/or pit areas and the edge of adjacent drainages, unless otherwise directed by DNRC.
- e. Drilling, casing, and cementing operations shall be designed and conducted as requested by MBOGC.
- f. Construction and drilling activity will not be conducted using frozen or saturated material during periods when watershed damage or excessive rutting is likely to occur.
- g. With the overall objective of minimizing surface disturbance and retaining land stability and productivity, the lessee shall use equipment that is appropriate to the scope and scale of work being done for roads and well pads (use equipment no larger than needed for the job).
- h. To minimize electrocution potential to birds of prey, all overhead electrical power lines will be constructed to standards identified by the Avian Power Line Interaction Committee (1996).
- i. The lessee shall use wheel trenches or ditch witches to construct all pipeline trenches, except where extreme topography or other environmental factors preclude their use.
- j. Reserve pits:
  - i. Reserve pits will be adequately fenced during and after drilling operations until pit is reclaimed so as to effectively keep out wildlife and livestock. Adequate fencing is defined as follows:
    - 1. Construction materials will consist of steel or wood posts. Three or four strand wire (smooth or barbed) fence or hog panel (16 foot length by 50 inch height) or plastic snow fence must be used with connectors such as fence staples, quick-connect clips, hog rings, hose clamps, twisted wire, etc.
    - 2. Construction standards: Posts shall be firmly set in ground. If wire is used it must be taut and evenly spaced, from ground level to top wire, to effectively keep out animals. Hog panels must be tied and sturdy. Fence must be at least 2 feet from edge of pit. Three sides must be fenced prior to commencing drilling, and the fourth side of the fence immediately upon completion of drilling, prior to rig release. Fence must be left up and maintained in adequate condition until pit is closed.

- ii. The reserve pit will be oriented to prevent collection of surface runoff. After the drilling rig is moved, the lessee may need to construct a trench on the uphill side of the reserve pit to divert surface drainage around it. If constructed, the trench will be left intact until the pit is closed.
- iii. The reserve pit will be lined with an impermeable liner if required by the DNRC or MBOGC. An impermeable liner is any liner having a permeability less than  $10^{-7}$  cm/sec. The liner will be installed so that it will not leak and will be chemically compatible with all substances that may be put in the pit. Liners made of any man-made synthetic material will be of sufficient strength and thickness to withstand normal installation and pit use. In gravelly or rocky soils, a suitable bedding material such as sand will be used prior to installing the liner.
- iv. The reserve pit will be constructed so that at least half of its total volume is in solid cut material (below natural ground level).
- v. The only fluids/waste materials which are authorized to go into the reserve pit are RCRA exempt exploration and production wastes:
  - 1. Drilling muds and cutting
  - 2. Rigwash
  - 3. Excess cement and certain completion and stimulation fluids defined by EPA as exempt
- vi. It may not include drilling rig waste, such as:
  - 1. Hydraulic fluids
  - 2. Engine oil
  - 3. Oil filters
  - 4. Cement, drilling mud, or other product sacks
  - 5. Paint, pipe dope, chemical, or other product container.
  - 6. Chemicals and chemical rinsate.
- vii. Any evidence of non-exempt wastes being put into the reserve pit may result in the DNRC requiring specific testing and closure requirements.
- k. Evaporation Pits and Storage Ponds:
  - i. Applicant will submit the following information with their pit proposal:
    - 1. A map and drawings of the site on a suitable scale that show the pit dimensions, cross section, side slopes, leak detection system, and a location relative to other site facilities.
    - 2. The daily quantity of water to be disposed of (maximum daily quantity shall be cited if major fluctuations are anticipated) and a water analysis that includes the concentrations of chlorides, sulfates, pH, Total Dissolved Solids (TDS), and other toxic constituents.
    - 3. Criteria used to determine the pit size
    - 4. The average monthly evaporation and average monthly precipitation for the area.
    - 5. The method and schedule for periodic disposal of precipitated solids and a copy of the appropriate disposal permit, if any.
    - 6. They type, thickness, and life span of material to be used for lining the pit and the method of installation. The manufacturer's guidebook and information for the product shall be included if available.
  - ii. All pits will be lined with a minimum 12 mil thickness liner.
  - iii. A minimum 2 feet of freeboard is required on all pits and ponds.

- iv. Applicants shall submit water quality analysis on an annual basis for each pit or pond.
- v. All evaporation pits and storage ponds must be fenced.
- vi. All evaporation pits and storage ponds shall be constructed away from established drainage patterns, including intermittent/ephemeral drainage ways, and unstable ground or depressions in the area.
- vii. Upon the department's request, lessee shall contract a soil scientist to determine suitability of each pit location.
- l. Culverts:
  - i. Culverts will be placed on channel bottoms on firm, uniform beds, which have been shaped to accept them, and aligned parallel to the channel to minimize erosion. Backfill will be thoroughly compacted.
  - ii. All culverts will be appropriately sized.
- m. Pipelines:
  - i. Pipeline construction shall not block nor change the natural course of any drainage. Pipelines shall cross perpendicular to drainages. Pipelines shall not be run parallel in drainage bottoms. Suspended pipelines shall provide adequate clearance for maximum runoff.
  - ii. Pipeline trenches shall be compacted during backfilling. Pipeline trenches shall be routinely inspected and maintained to ensure proper settling, stabilization, and reclamation.
- n. During construction, emissions of particulate matter from well pad and road construction would be minimized by application of water or other non-saline dust suppressants with at least 50 percent control efficiency. Dust inhibitors (surfacing materials, non-saline dust suppressants, and water) will be used as necessary on unpaved roads that present a fugitive dust problem. The use of chemical dust suppressants on state surface will require prior approval from DNRC.
- o. Lessees are required to obtain a National Pollution Discharge Elimination System (NPDES) Storm Water Permit from MDEQ as required prior to any surface disturbing activities.
- p. If in the process of air drilling the wells there is a need to use mud, all circulating fluids will be contained either in an approved pit or in an aboveground containment tank. The pit or containment tank will be large enough to safely contain the capacity of all expected fluids without danger to overflow. Fluid and cuttings will not be squeezed out of the pit, and the pit will be reclaimed in an expedient manner.
- q. Production facilities (including dikes) must be placed on the cut portion of the location and a minimum of 15 feet from the toe of the back cut unless otherwise approved by DNRC.
- r. A complete copy of the Application for Permit to Drill (APD), including conditions, stipulations, and the H2S contingency plan (if required) shall be available for reference at the well site during the construction and drilling phases.
- s. This drilling permit is valid for either one year from the approval date or until lease expiration, whichever comes first.

### **C. Operations/Maintenance**

- a. Waste Disposal:
  - i. Trash or other debris must not be disposed of on the pad.
  - ii. Burning of materials or oil is not allowed.
  - iii. All waste, other than human waste and drilling fluids, will be contained in a portable trash cage. This waste will be transported to a State approved

waste disposal site immediately upon completion of drilling operations. No trash or empty barrels will be placed in the reserve pit or buried on location. All state and local laws and regulations pertaining to disposal of human and solid waste will be complied with.

- iv. Sewage shall be placed in a self-contained, chemically treated porta-potty on location.
- v. The lessee and their contractors shall ensure that all use, production, storage, transport, and disposal of hazardous materials associated with the drilling, completion, and production of these wells will be in accordance with all applicable existing and hereafter promulgated federal, state, and local government rules, regulations, and guidelines. All project related activities involving hazardous materials will be conducted in a manner to minimize potential environmental impacts. In accordance with OSHA requirements, a file will be maintained onsite containing current Material Safety Data Sheets (MSDS) for all chemicals, compounds, and/or substances which are used in the course of construction, drilling, completion, or production operations.
- b. The lessee shall complete CBNG wells (case, cement, and under ream), or abandon as soon as possible, but no later than 30 days after drilling operations, unless an extension is given by DNRC.
- c. Confine all equipment and vehicles to the access road(s), pad(s), and area(s) specified in the approved APD or POD.
- d. Rat and mouse holes shall be filled and compacted from the bottom to the top immediately upon release of the drilling rig from the location.
- e. Noxious Weeds:
  - i. The lessee will be responsible for prevention and control of noxious weeds and weeds of concern on all areas of surface disturbance associated with this project (well locations, roads, water management facilities, etc.) Use of pesticides shall comply with the applicable State laws. Pesticides shall be used only in accordance with their registered uses and within limitations. Lessee shall monitor disturbed areas for the presence of noxious weeds from June through September throughout the life of the field.
  - ii. Control efforts must be done as necessary and as specified by DNRC once noxious weeds are identified with the intent of eradicating and preventing seed production.
- f. All permanent above-ground structures (e.g. production equipment, tanks, etc.) not subject to safety requirements will be painted to blend with the natural color of the landscape. The paint used will be a color acceptable to DNRC.
- g. Lessees are advised that prior to installation of any oil and gas well production equipment which has the potential to emit air contaminants, the owner or lessee of the equipment must notify the Montana Department of Environmental Quality (MDEQ) to determine permit requirements. Examples of pertinent well production equipment include fuel-fired equipment (e.g. diesel generators), separators, storage tanks, engines, and dehydrators.
- h. Fire Safety:
  - i. During the fire season (June-October), the lessee shall institute all necessary precautions to ensure that fire hazard is minimized, including, but not limited to, mowing vegetation on the access route(s) and well location(s), keeping fire fighting equipment readily available when drilling, etc. DNRC may also require additional measures for fire prevention.

- ii. If a fire is started by lessee activities, the lessee may be liable for suppression costs by 50-63-103, MCA.
- i. Erosion:
  - i. Upgrade and maintain access roads and drainage control (e.g. culverts, drainage dips, ditching, crowning, surfacing, etc.) as necessary and as directed by DNRC to prevent soil erosion and accommodate safe, environmentally sound access.
  - ii. DNRC may direct additional control measures for roads, pipelines, drainages, or other surface disturbances as needed.
- j. Any spilled or leaked oil, produced water, or treatment chemicals must be reported in accordance with MBOGC requirements and immediately cleaned up in accordance with DNRC requirements. This includes cleanup and proper disposition of soils contaminated as a result of such spills/leaks.
- k. Changes in operational and/or environmental conditions may require additional or modified requirements.
- l. No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of 4 inches deep, the soil shall be deemed too wet to adequately support construction equipment.
- m. All water discharge must comply with State law and must have permit prior to commencing.
- n. Landscape those areas not required for production to the surrounding topography as soon as possible. The fluids and mud must be dry in the reserve pit before recontouring pit area. The lessee will be responsible for recontouring and reseeding of any subsidence areas that develop from closing a pit.

#### **D. Dry Hole/Reclamation**

- a. When individual facilities such as well locations, pipelines, discharge points, impoundments, etc. are no longer needed, they need to be addressed in a reclamation plan and approved by the DNRC. Individual items that will need to be addressed in reclamation plans include, but are not limited to:
  - i. Configuration of reshaped topography, drainage systems, and other surface manipulations.
  - ii. Waste disposal
  - iii. Revegetation methods, including specific seed mix (pounds pure live seed/acre) and soil treatments (seedbed preparation, fertilization, mulching, etc.).
  - iv. Other practices that will be used to reclaim and stabilize all disturbed areas, such as water bars, erosion fabric, hydro-mulching, etc.
  - v. An estimate of the timetables for beginning and completing various reclamation operations relative to weather and local land uses.
  - vi. Methods and measures that will be used to control noxious weeds, addressing both ingress and egress to the individual well or POD.
  - vii. Decommissioning/removal of all surface facilities.
  - viii. Closure, reclamation, or approved transfer of areas utilized for produced CBNG water, including discharge points, reservoirs, off-channel pits, land application areas, livestock/wildlife watering facilities, surface discharge stream channels, etc.
- b. For abandonment, surfacing material and culverts must be removed unless requested to remain in place by DNRC. The roads and ditches must be recontoured and seeded in accordance with DNRC requirements.



c. Pit reclamation:

1. All pit(s) must be emptied of all fluids within 90 days after completion of drilling operations. The pit must be closed properly to assure protection of soil, water, and vegetation.
  2. Squeezing of pit fluids and cuttings is prohibited. Pits must be dry of fluids or they must be removed via vac truck or other environmentally acceptable method and disposed of in a State approved location prior to backfilling, recontouring, and replacement of topsoil.
  3. The pit may not be cut or trenched.
  4. Pit mud/sludge material may be buried onsite after the material has dried.
  5. The pit material must be covered with a minimum of 1 ½' of soil.
  6. The lessee will be responsible for recontouring any subsidence areas that develop from closing a pit.
  7. The plastic pit liner (if any) may be folded in with prior BOGC approval.
- d. The reclamation effort will be evaluated as a success if the previously disturbed area is stabilized, all potential water erosion is effectively controlled and the vegetative stand is established with at least 70% cover.
- e. All disturbed lands associated with this project, including the pipelines, access roads, water management facilities, etc. will be expediently reclaimed and reseeded in accordance with the surface use plan and any pertinent site-specific reclamation.
- f. Disturbed lands will be recontoured back to conform with existing undisturbed topography. No depressions will be left that trap water or form ponds.
- g. Before the location has been reshaped and prior to redistributing the topsoil, the lessee will rip or scarify the drilling platform and access road on the contour, to a depth of at least 12 inches. The rippers are to be no further than 24 inches apart.
- h. Topsoil shall be evenly distributed.. Prepare the seedbed by disking to a depth of 4 to 6 inches following the contour.
- i. Waterbars are to be constructed at least one foot deep, on the contour with approximately two feet of drop per 100 feet of waterbar to ensure drainage, and extended into established vegetation. All waterbars are to be constructed with their berm on the downhill side to prevent the soft material from silting in the trench. The initial waterbar should be constructed at the top of the backslope. Subsequent waterbars should follow the following general spacing guidelines:

Slope (Percent)	Spacing Interval (Ft)
<2	200
2-4	100
4-5	75
>5	50

- j. The lessee will drill seed on the contour to a depth of 0.5 inch, followed by cultivation to compact the seedbed, preventing soil and seed losses.
- i. Slopes too steep for machinery may be hand broadcast and raked with twice the specified amount of seed. To be effective, complete spring seeding after the frost has left the ground and prior to May 15. Fall or

dormant seedings must be completed according to NRCS timing recommendations.

- k. A Final Abandonment Notice must be submitted prior to a final abandonment evaluation by DNRC.
- l. Soil fertility testing and the addition of soil amendments may be required to stabilize some disturbed lands.
- m. Reduce the backslope to 2:1 and the foreslope to 3:1 unless otherwise directed by DNRC. Reduce slopes by pulling fill material up from foreslope into the top of cut slopes
- n. The lessee shall seed all disturbed areas, using an agreed upon method suitable for the location. Seeding shall be repeated if a satisfactory stand is not obtained as determined by DNRC upon evaluation after the following growing season. The lessee shall seed all disturbed areas with the seed mixture(s) listed below unless otherwise approved by DNRC area office. The seed mixture(s) shall be planted in the amounts specified in pounds of pure live seed (PLS)/acre. There shall be no primary or secondary noxious weed seed in the seed mixture. Seed shall be tested and the viability testing of seed shall be done in accordance with State law(s) and within six months prior to purchase. The seed mixture container shall be tagged in accordance with State law(s) and available for inspection by DNRC.
- o. Seed shall be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture shall be evenly and uniformly planted over the disturbed area. Smaller/heavier seeds have a tendency to drop to the bottom of the drill and are planted first. The lessee shall take appropriate measures to ensure this doesn't occur. Where drilling is not possible, seed shall be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre noted below are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by DNRC. Evaluation of growth will not be made before completion of the second growing season after seeding. DNRC is to be notified a minimum of seven days prior to seeding of the project.
  - i. **Seed Mixture** (silty, clayey, or silt clay loams)
    - a) The combination must include at least four of the following species. Western wheatgrass must be included in the mix. Thickspike wheatgrass may be substituted for wheatgrass only when western wheatgrass is unavailable. Species and variety substitution may be approved by the DNRC Area Office.

Species of Seed	Variety	Common Name	Pound/acre PLS)*
Pascopyrum smithii	Rosanna	Western Wheatgrass	3.00
Pseudoroegneria spicata	Goldar	Bluebunch wheatgrass	2.00
Stipa viridula	Lodom	Green needlegrass	2.00
Elymus trachycaulus	Pryor	Slender wheatgrass	2.00
Stipa comata		Needle and thread	1.00
Bouteloua curtipendula		Sideoats Grama	2.00
Schizachyrium scoparium		Little bluestem	2.00

- p. *\* Pure live seed (PLS) formula: % of purity of seed mixture times % germination of seed mixture = portion of seed mixture that is PLS.*

